CLAIMS

1. A speech signal noise elimination device comprising:

a pitch component extraction means which acquires a speech signal representing the waveform of a speech to extract the pitch component of the speech from the speech signal; and

gain determination means which determines the gain of the speech signal based on the intensity of the extracted pitch component to amplify or attenuate the speech signal by use of the determined gain.

2. The speech signal noise elimination device according to claim 1, wherein the pitch component extraction means comprises:

a variable filter which varies the pass band thereof according to a control and filters the speech signal to thereby extract components within the pass band; and

a filter characteristic determination section which, to cause the variable filter to extract the pitch component, identifies the fundamental frequency of the speech based on the speech signal and controls the variable filter so that the filter has a pass band in which components other than the identified fundamental frequency and vicinity thereof are cut off.

3. The speech signal noise elimination device according to claim 2, wherein the filter characteristic determination section includes a cepstrum analysis section which identifies as the fundamental frequency of the speech, a

frequency at which the cepstrum of the speech signal has a maximal value.

4. The speech signal noise elimination device according to claim 2, wherein the filter characteristic determination section includes a cross detection section which filters a speech signal to eliminate a band in which the fundamental frequency component is not substantially contained, and identifies a timing at which non-eliminated components reach a predetermined value, and identifies the fundamental frequency based on the identified timing.

5. The speech signal noise elimination device according to claim 4, wherein:

the cross detection section determines, based on the identified timing, whether or not the speech contains the fundamental frequency component of a certain amount or more and, if not, the cross detection section notifies the variable filter that the pitch component is not contained; and

the variable filter cuts off the speech signal in response to the notification that the pitch component is not contained.

6. The speech signal noise elimination device according to any one of claims 1 to 5, wherein the gain determination means determines, based on the intensity of the extracted pitch component within one time period, the gain of the

speech signal in the time period and a predetermined time period preceding the time period.

7. A speech signal noise elimination method comprising:

acquiring a speech signal representing the waveform of a speech to extract the pitch component of the speech from the speech signal; and

determining the gain of the speech signal based on the intensity of the extracted pitch component to amplify or attenuate the speech signal by use of the determined gain.

8. A program for allowing a computer to function as:

pitch component extraction means which acquires a speech signal representing the waveform of a speech to extract the pitch component of the speech from the speech signal; and

gain determination means which determines the gain of the speech signal based on the intensity of the extracted pitch component to amplify or attenuate the speech signal by use of the determined gain.